

ABSTRACT OF THE DISCLOSURE

Driving rollers 2, 3 which rotate in the same direction are arranged in parallel to each other. A plurality of convex portions 5a, 5b, 5c having different radii of curvature $Rr1$, $Rr2$ and $Rr3$ are formed along the axial direction at opposing positions on the driving rollers 2, 3. A rolling element 4 which is fed into the gap between the driving rollers 2, 3 and rotated is moved along tracks having different radii of curvature $Rw1$, $Rw2$ and $Rw3$ in the axial direction. There is provided a superfinishing grindstone 6 which is pressed on the rolling surface of the rolling element 4 moving on tracks having different radii of curvature to superfinish the rolling surface of the rolling element 4.